

Application No.: 09/111833

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REMARKS

Claim 20 has been cancelled, and claims 14-17 and 19 have been amended to define a product that has properties different from the properties of prior art electret filters, including the filter disclosed in U.S. Patent 4,874,399 to Reed et al.

In the Office Action mailed September 23, 2003, claims 14-20 continued to be rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,874,399 to Reed et al. (Reed) by itself or in combination with in view of Japanese Publication 55-138223 to Tamura and U.S. Patent 4,548,628 to Miyake et al. (Miyake). Applicants submit that this rejection is not sustainable. Although applicants have amended the claims to insert process limitations, patentability is not being asserted based on the method of preparation but rather is based on the properties possessed by the final product. If a product is produced by a method that imparts distinctly different properties into the product, then product-by-process claims that define the product should be patentable.¹

The primary reference to Reed discloses an electret filter media containing polypropylene and poly(4-methyl-1-pentene). The reference teaches that improved filtration performance can be demonstrated when the fibers contain a blend of both polypropylene and poly(4-methyl-1-pentene). Corona charging is used to impart charge to the fibers. Webs that are produced by corona charging exhibit charge configurations that resemble the configuration shown in FIG. 5A of U.S. 6,119,691 (copy enclosed).

Tamura discloses a method of manufacturing an electret. In example 3, Tamura mentions that distilled water can be propelled on a Teflon™ film at high pressure and describes how the pieces of this Teflon™ electret were washed with water, acetone, alcohol, etc., and after being dried, an electret was produced by using a corona discharge method (see example 3).

Miyake discloses a filter medium and a process for making the filter medium. The filter medium is prepared by jetting high-pressure water to at least one surface of the fibrous microwebs, after or without heat treatment, from nozzles having a diameter of 0.05 to 0.5 mm. Water is jetted onto the filter medium to entangle the fibers. A web or webs are composed of

¹ See, *In re Thorp*, 777 F.2d 195, 227 USPQ 964, 966 (Fed. Cir. 1985) ("We also agree that on the entirety of the record the PTO had correctly adduced a *prima facie* case, and that the burden had shifted to Thorpe, "to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product.").

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mainly ultra-fine combustible synthetic fibers having a single fiber diameter of 0.1 to 1.5 μ . Nowhere does Miyake disclose that the resulting filter is charged as a result of the water jet treatment.

Applicants' invention pertains to a new electret filter media and to a face mask and respirator that use such an electret filter media. As shown in applicants' examples, the electret filter media of the present invention has penetration and quality factor values different from comparative electret webs. In particular, applicants have demonstrated that their web exhibits enhanced filtration properties characterized by the quality factor QF over webs that contain blends of polypropylene and poly(4-methyl-1-pentene) as disclosed in Reed. The Examiner's attention is directed, in particular, to the data set forth in Tables 6-9.

Reed preferably imparts electric charge to its fibrous webs through use of a corona (column 4, lines 18-21). The melt-blown microfiber electret filters disclosed in Reed contain at least one weight percent poly(4-methyl-1-pentene) (TPX) and polypropylene.

In Table 2 of the present application, applicants have shown that a web that is corona treated followed by water treatment exhibits QF values that are distinctly different and better than those for a web that was only corona treated. These samples contained 100 percent polypropylene.

In the examples set forth in Table 3, again improved QF values were demonstrated for samples of the invention that were subjected to corona treatment followed by water treatment. In these samples the polymer used was 100 percent TPX. In Table 6, applicants have shown that the product of their invention exhibits a QF value that is distinctly different from a web that is only corona charged for a product that contains a blend of 75 percent polypropylene and 25 percent TPX. In Example 28, the web contains 75 percent polypropylene and 25 percent TPX. In Example 29, the ratio of polypropylene to TPX was 50:50. In Example 30, the ratio of polypropylene to TPX was 25:75, and in Examples 31 and 32, the ratios of polypropylene to TPX was 75:25. For ease of reference, the data is reproduced below:

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Example	Type of Charging	% Polypropylene	% TPX	QF
C3	Corona	100	0	0.38
C4	Corona	100	0	0.46
8	Corona/H ₂ O	100	0	0.55
9	Corona/H ₂ O	100	0	0.57
10	Corona/H ₂ O	100	0	0.61
11	Corona/H ₂ O	100	0	0.66
12	Corona/H ₂ O	100	0	0.80
13	Corona/H ₂ O	100	0	0.79
14	Corona/H ₂ O	100	0	0.75
15	Corona/H ₂ O	100	0	0.61
C5	Corona	0	100	0.85
16	Corona/H ₂ O	0	100	1.31
17	Corona/H ₂ O	0	100	2.06
18	Corona/H ₂ O	0	100	2.06
19	Corona/H ₂ O	0	100	1.97
20	Corona/H ₂ O	0	100	1.75
21	Corona/H ₂ O	0	100	1.12
C9	Corona	100	0	0.56
25	H ₂ O	100	0	0.36
26	Corona/H ₂ O	100	0	0.67
C10	Corona	75	25	0.51
27	Corona/H ₂ O	75	25	1.16
C28	Corona	75	25	0.75
28	Corona/H ₂ O	75	25	1.45
C29	Corona	50	50	0.8
29	Corona/H ₂ O	50	50	1.30
C30	Corona	25	75	0.9
30	Corona/H ₂ O	25	75	1.49
C31	Corona	75	25	0.73
31	Corona/H ₂ O	75	25	1.52
C32	Corona	75	25	0.42
32	Corona/H ₂ O	75	25	1.2

In view of the above data, applicants have demonstrated that the electret webs of their invention possess properties that are distinctly different from the properties of electret webs that are disclosed in Reed. Neither Tamura nor Miyake describes a fibrous web that has electret charge imparted to it as a result of corona charging, followed by water contact. Tamura indicates

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that the charge is only placed on a Teflon™ film through water, and Miyake uses water to entangle the fibers. Thus, Tamura and Miyake do not describe fibrous webs that would exhibit the charge configuration of applicants' electret filter media. In view of these distinct differences, applicants respectfully submit that the product-by-process claims define patentable subject matter over the art of record.

Respectfully submitted,

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